



SEQUENCE LISTING

<110> Pizza, Mariagrazia
Giuliani, Marzia M
Rappuoli, Rino

<120> IMMUNOGENIC DETOXIFIED MUTANT E. COLI LT-A-TOXIN

<130> 2302-0342.10

<140> 09/528,682

<141> 2000-03-20

<150> PCT/IB97/01440

<151> 1997-10-30

<150> 09/297,171

<151> 1999-04-27

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<170> PatentIn Ver. 2.0

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<211> 240

<212> PRT

<213> Escherichia coli

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Arg Gly Thr Gln Met Asn Ile Asn Leu Tyr Asp His Ala Arg Gly Thr
35 40 45

Gln Thr Gly Phe Val Arg Tyr Asp Asp Gly Tyr Val Ser Thr Ser Leu
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Ser Leu Arg Ser Ala His Leu Ala Gly Gln Ser Ile Leu Ser Gly Tyr
65 70 75 80

Ser Thr Tyr Tyr Ile Tyr Val Ile Ala Thr Ala Pro Asn Met Phe Asn
85 90 95

Val Asn Asp Val Leu Gly Val Tyr Ser Pro His Pro Tyr Glu Gln Glu
100 105 110

Val Ser Ala Leu Gly Gly Ile Pro Tyr Ser Gln Ile Tyr Gly Trp Tyr
115 120 125

Arg Val Asn Phe Gly Val Ile Asp Glu Arg Leu His Arg Asn Arg Glu
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Tyr Arg Asp Arg Tyr Tyr Arg Asn Leu Asn Ile Ala Pro Ala Glu Asp

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Glu Pro Trp Ile	His His Ala Pro Gln Gly Cys Gly Asn Ser Ser Arg					
	180		185		190	
Thr Ile Thr Gly Asp Thr Cys Asn Glu Glu Thr Gln Asn Leu Ser Thr						
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Ile Tyr Leu Arg Glu Tyr Gln Ser Lys Val Lys Arg Gln Ile Phe Ser						
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 Asp Gly Arg Tyr Ser Asn Phe Ala Leu Ile Ser Ala Glu Gly Gly Met
 35 40 45
 Gln Asp Gly Asp Leu Phe Gly Thr Val Asn Gln Ser Asn Phe Pro Met
 50 55 60
 Ser Thr Phe Glu Gln Val Pro Asn Asn Lys Glu Phe Lys Gly Val Ile
 65 70 75 80
 Ser Ala Asn Val Lys Tyr Asp Met Asn Phe Lys Lys Leu Leu Arg Phe
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 100 105

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Asp Gly Arg Tyr Ser Asn Tyr Ala Leu Ile Ser Ala Glu Gly Gly Met
35 40 45
Asp Arg Asp Leu Phe Gly Ser Ala Asn Ile Asp Gly Phe Pro Glu Val
50 55 60
Arg Glu Phe Asn Ser Leu Pro Asn Asn Lys Ala Ser Ser Asp Thr Ala
65 70 75 80
Ser Leu Asn Lys Gln His Asp Ala Asp Phe Lys Lys Tyr Ile Lys Leu
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Leu Ile Asn Asn Asp Gly Phe Phe Ser Asn Asn Gly Gly Lys
100 105 110

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Lys Arg Ser Gly Gly Leu Met Pro Arg Gly His Asn Glu Tyr Phe Asp
20 25 30
Arg Gly Thr Gln Met Asn Ile Asn Leu Tyr Asp His Ala Arg Gly Thr
35 40 45
Gln Thr Gly Phe Val Arg Tyr Asp Asp Gly Tyr Val Ser Thr Ser Leu
50 55 60
Ser Leu Arg Ser Ala His Leu Ala Gly Gln Ser Ile Leu Ser Gly Tyr
65 70 75 80
Ser Thr Tyr Tyr Ile Tyr Val Ile Ala Thr Ala Pro Asn Met Phe Asn
85 90 95
Val Asn Asp Val Leu Gly Val Tyr Ser Pro His Pro Tyr Glu Gln Lys
100 105 110

Val	Ser	Ala	Leu	Gly	Gly	Ile	Pro	Tyr	Ser	Gln	Ile	Tyr	Gly	Trp	Tyr	115	120	125
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Gly	Tyr	Arg	Leu	Ala	Gly	Phe	Pro	Pro	Asp	His	Gln	Ala	Trp	Arg	Glu	165	170	175
Glu	Pro	Trp	Ile	His	His	Ala	Pro	Gln	Gly	Cys	Gly	Asn	Ser	Ser	Arg	180	185	190
Thr	Ile	Thr	Gly	Asp	Thr	Cys	Asn	Glu	Glu	Thr	Gln	Asn	Leu	Ser	Thr	195	200	205
Ile	Tyr	Leu	Arg	Glu	Tyr	Gln	Ser	Lys	Val	Lys	Arg	Gln	Ile	Phe	Ser	210	215	220
Asp	Tyr	Gln	Ser	Glu	Val	Asp	Ile	Tyr	Asn	Arg	Ile	Arg	Asp	Glu	Leu	225	230	235